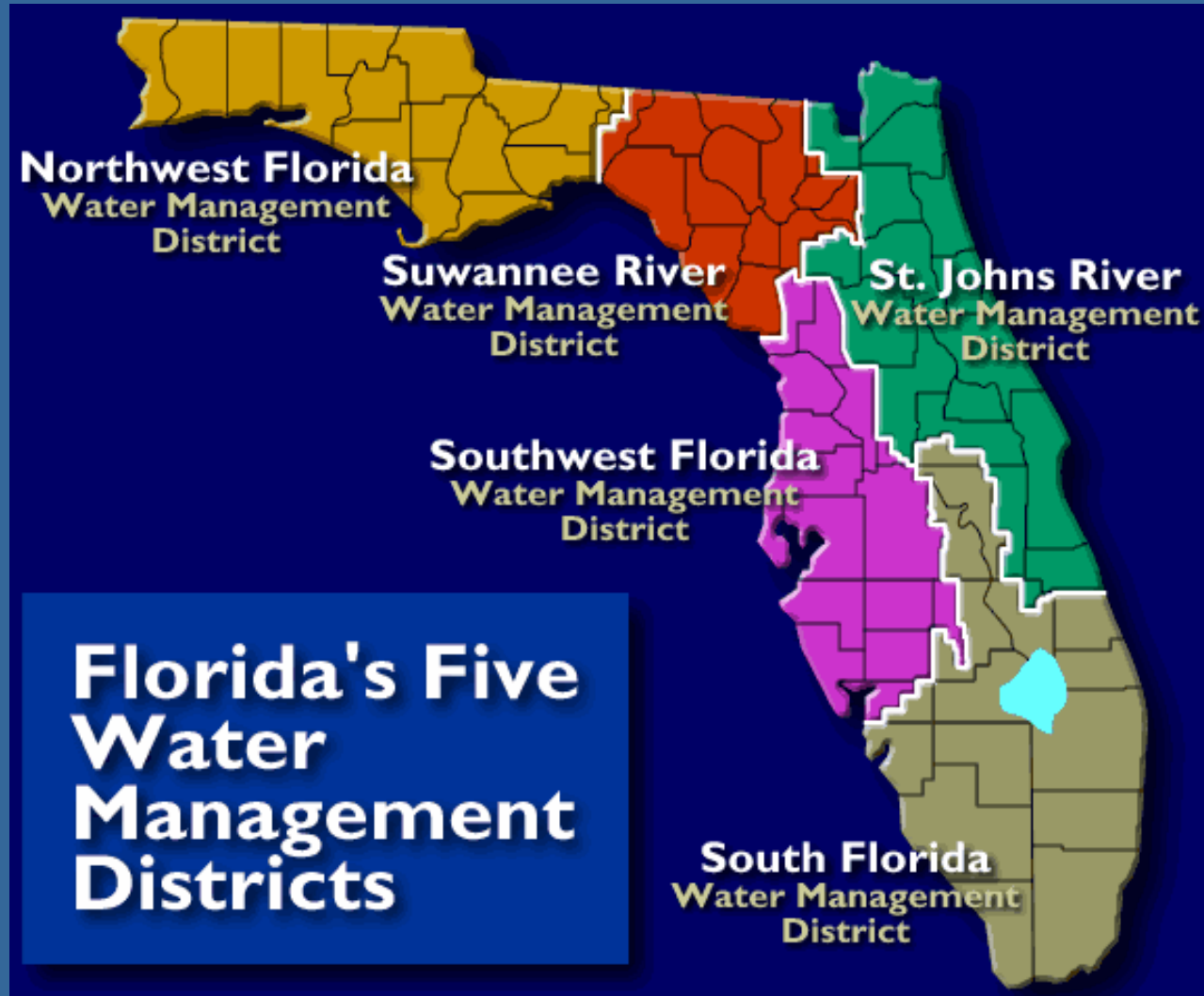


Bugs & TMDLs: An Evaluation of Macro-Invertebrate Communities in the Lower St. Johns River, Florida

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What is a Water Management District?



TMDLs for the LSJR:

Estuarine section

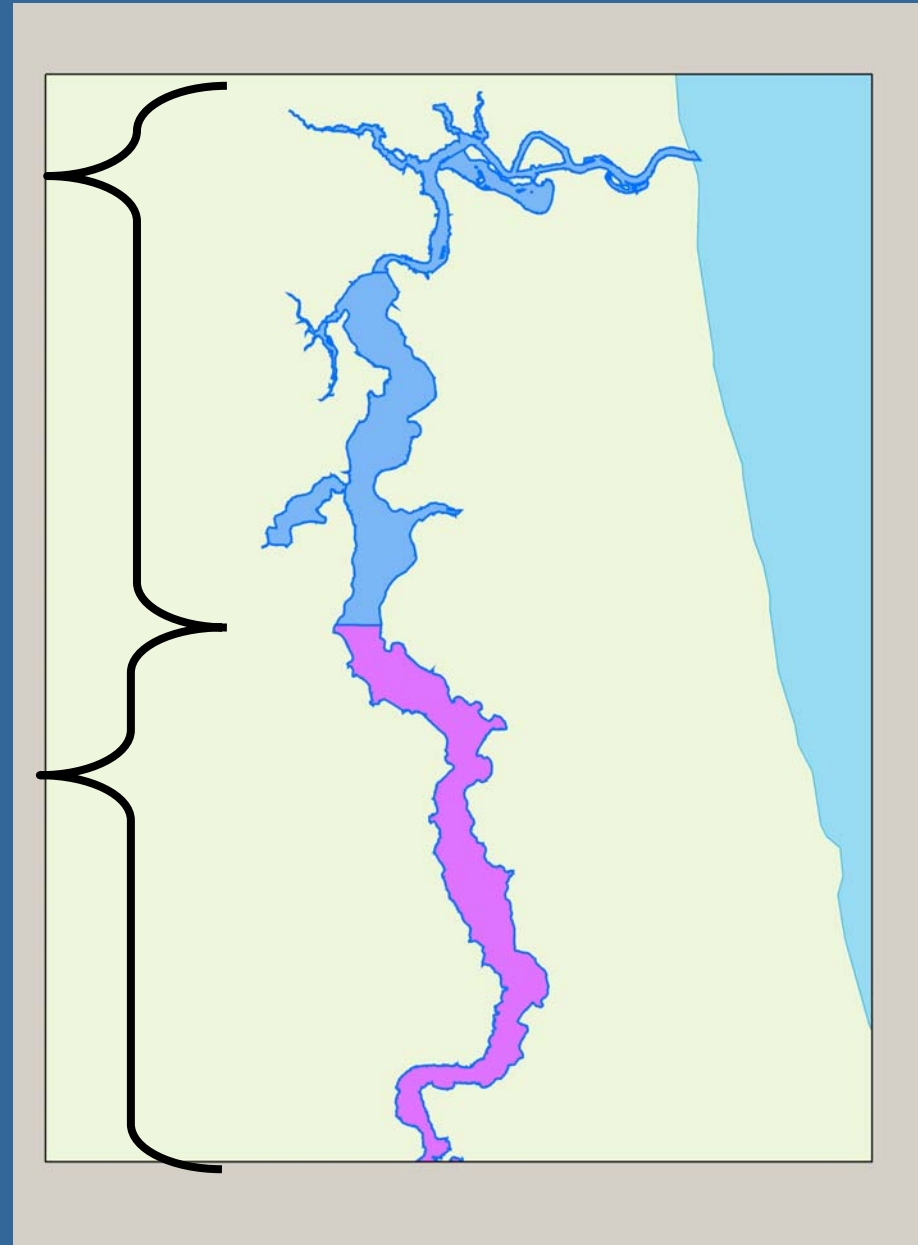
Total Nitrogen (1,472,984 kg/y)

No Phosphorus Limit

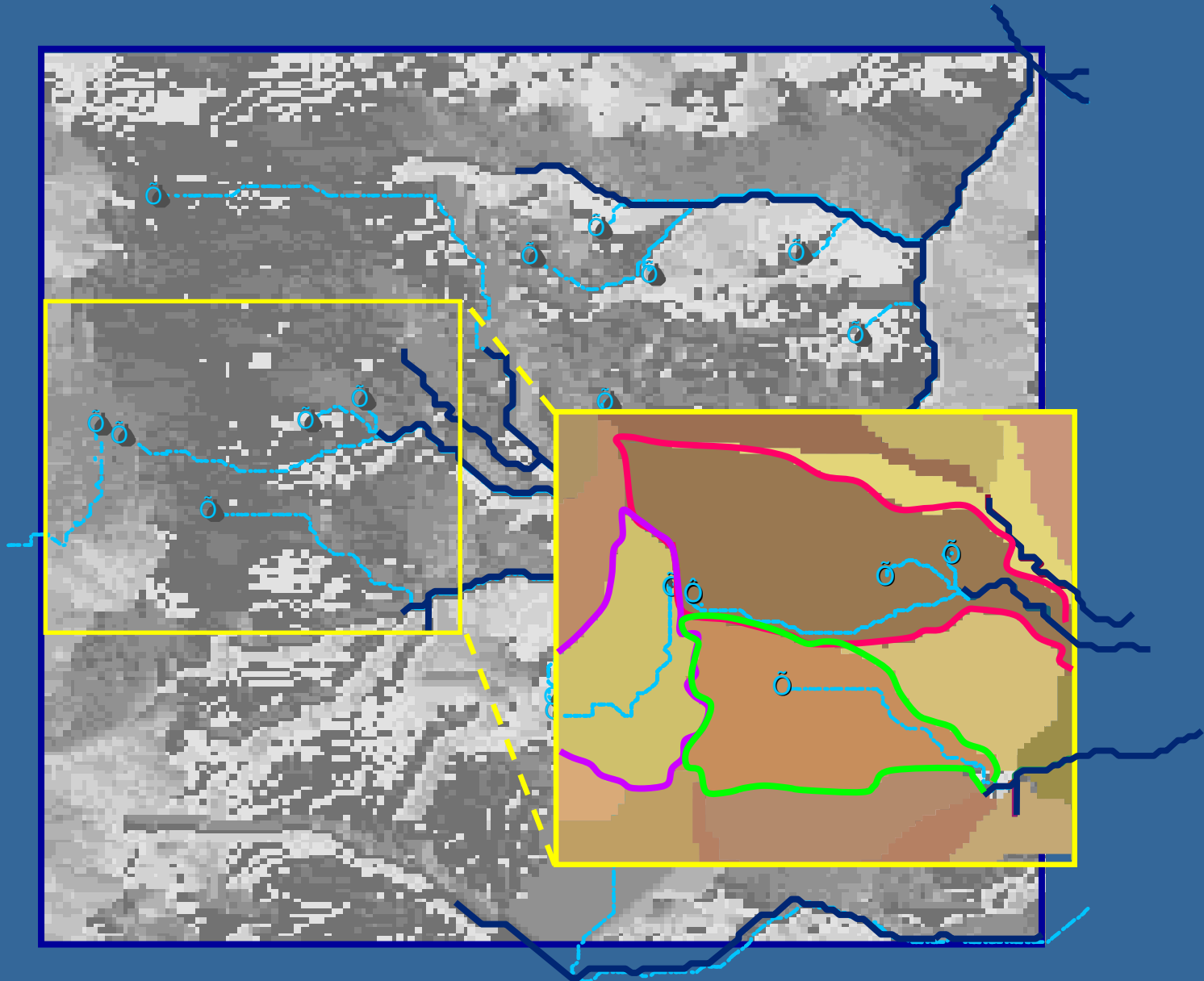
Freshwater section

Total Nitrogen (8,570,260 kg/y)

Total Phosphorus (500,325 kg/y)

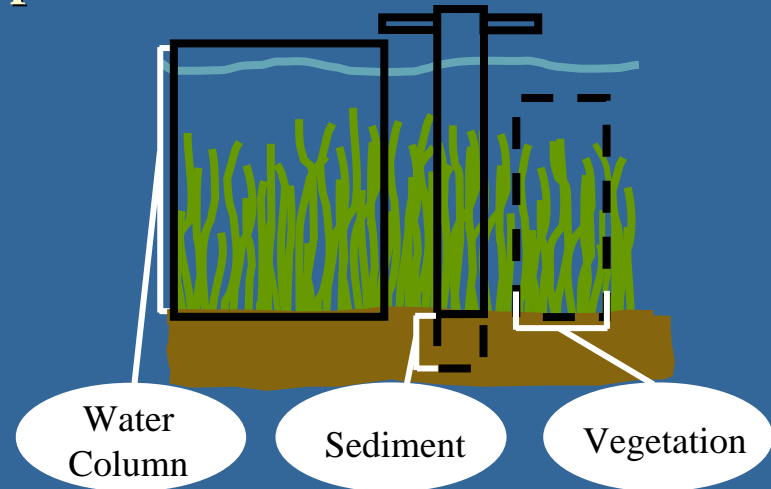


Determination of Drainage Area



Methods

Sample Collection:



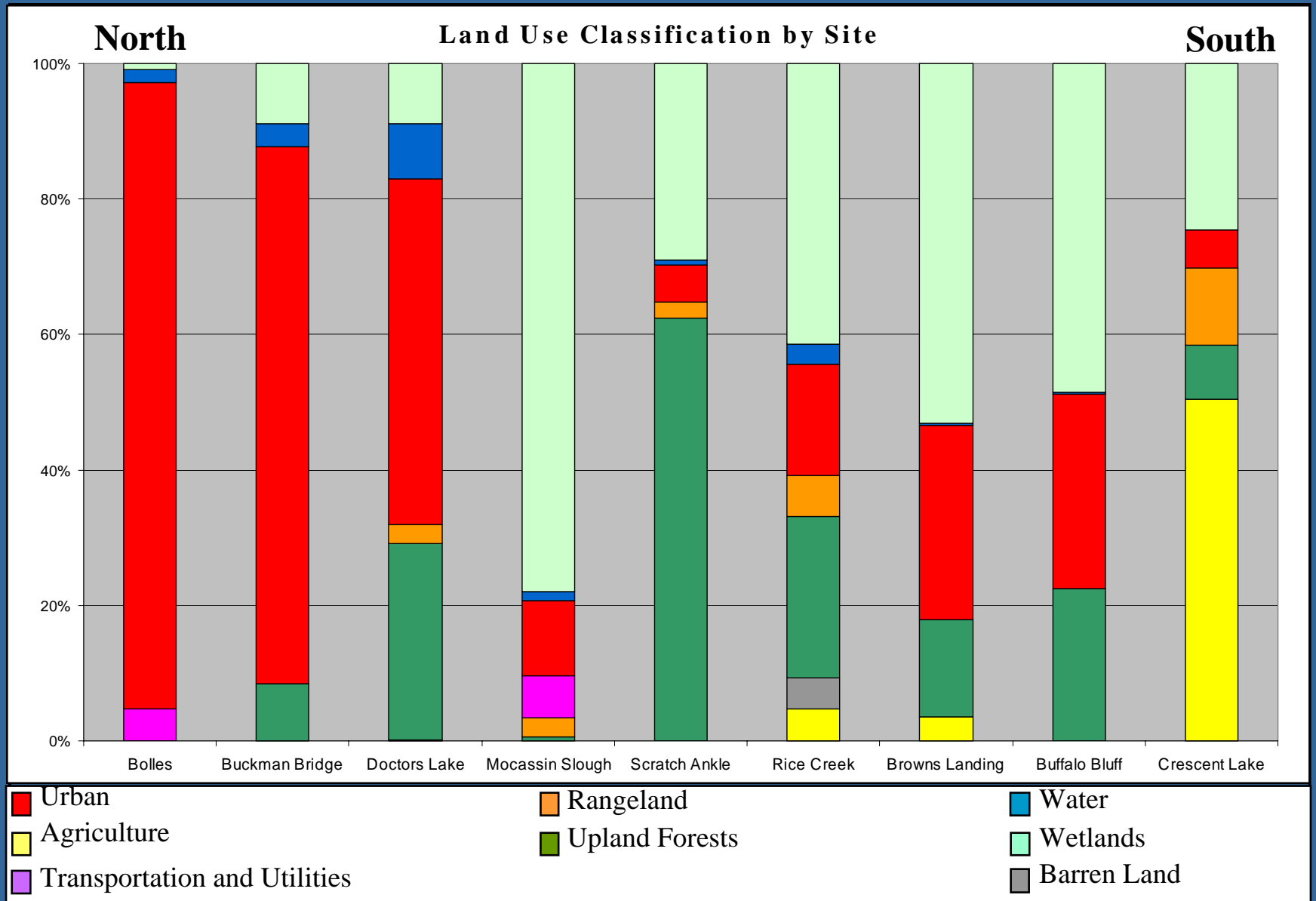
Water column - throw trap swept with a 300 micron dip net

Sediment - 3 random cores composited

Vegetation - all vegetation within a randomly tossed $\frac{1}{4}$ meter quad

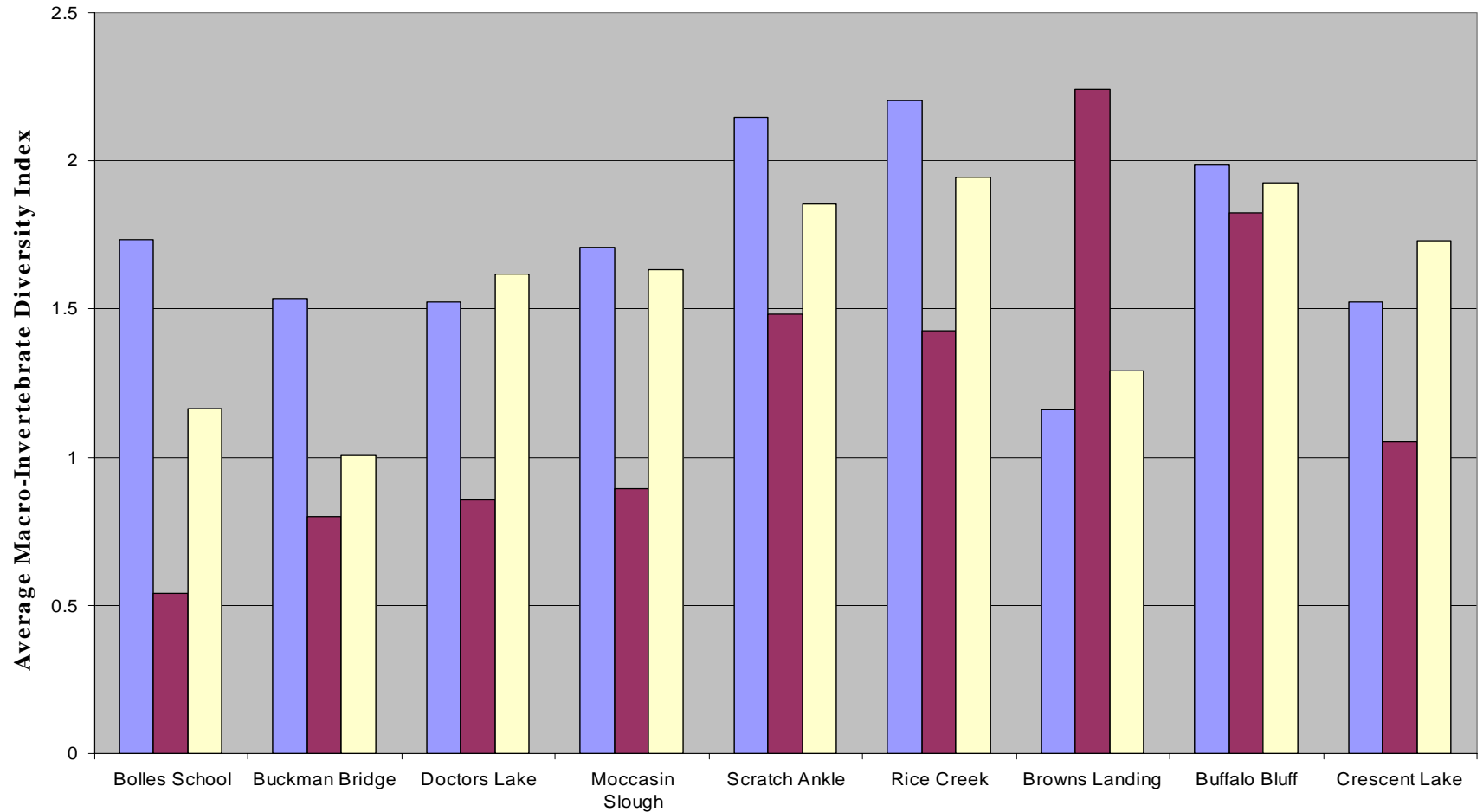


Results



Results

Shannon-Weaver Diversity Index for Macro-Invertebrates

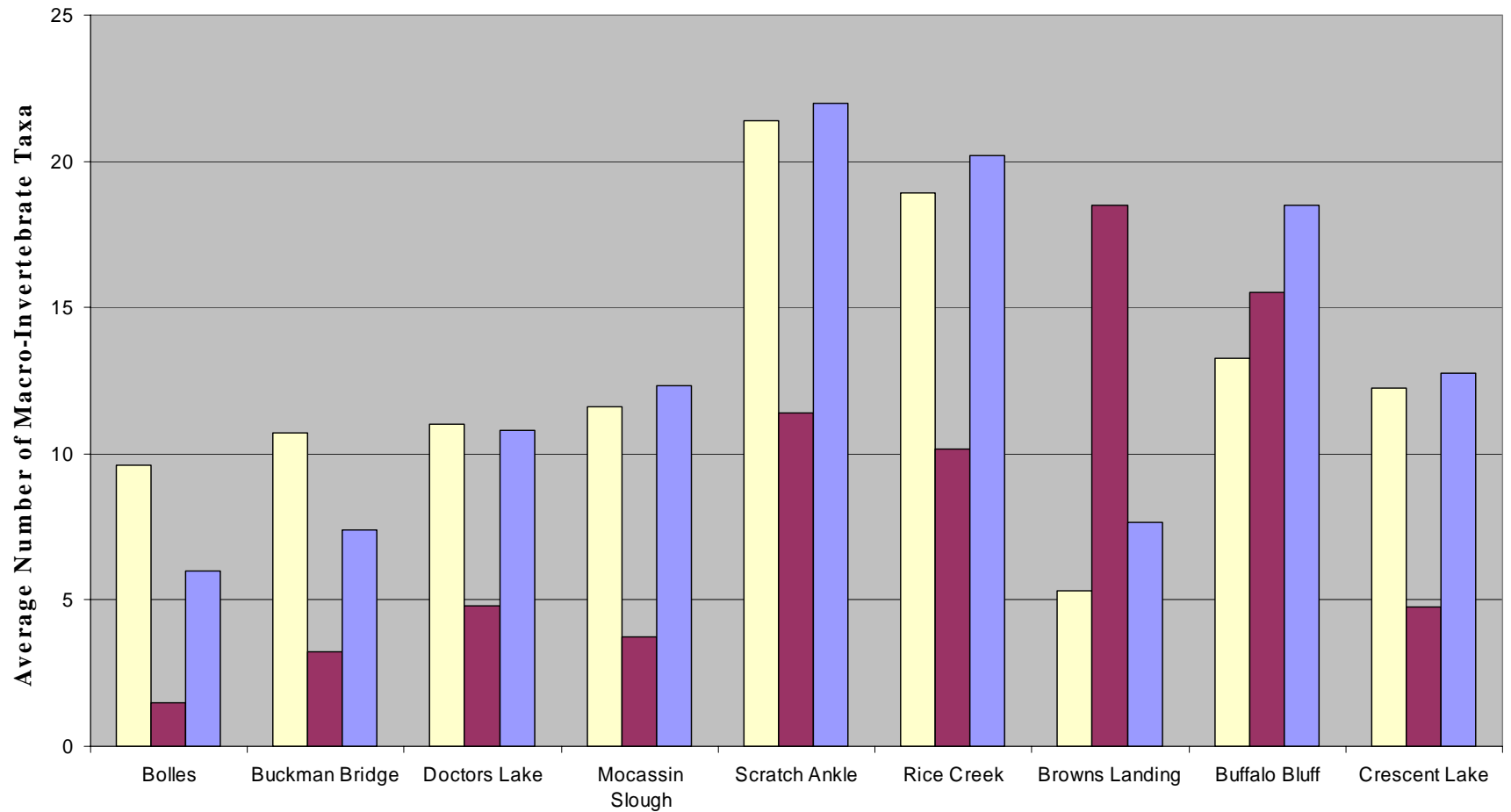


Macro-Invertebrate Community Identified Within Each Component

 Sediment Component  Vegetation Component  Water Column Component

Results

Macro-Invertebrate Species Richness per Component



Macro-Invertebrate Community Identified Within Each Component

 Sediment Component  Vegetation Component  Water Column Component

Results

Correlation coefficients and p-values for each component type as it relates to each land use.

Component	Land Use	Correlation	P-Value
Vegetation	Urban	-0.604	0.0869
	Agricultural	-0.063	0.8773
	Rangeland	-0.045	0.9119
	Upland Forests	0.565	0.1172
	Water	-0.339	0.3877
	Wetlands	0.47	0.2117
	Barren Land	0.225	0.5758
	Transportation and Utilities	-0.636	0.0658
Sediment	Urban	-0.295	0.4566
	Agricultural	-0.001	0.9987
	Rangeland	0.315	0.4246
	Upland Forests	0.557	0.1240
	Water	0.049	0.9053
	Wetlands	-0.121	0.7661
	Barren Land	0.404	0.2934
	Transportation and Utilities	-0.075	0.8533
Water Column	Urban	-0.843	0.0026
	Agricultural	0.139	0.7336
	Rangeland	0.46	0.2229
	Upland Forests	0.589	0.0973
	Water	-0.169	0.6754
	Wetlands	0.476	0.2041
	Barren Land	0.455	0.2286
	Transportation and Utilities	-0.226	0.5731

Summary

- A statistically significant negative correlation was identified between urban land use and the invertebrate community within the water column
- Sampling method not designed for this analysis
- Other potential contributing factors:
 - multiple land use types within the same sample area
 - black water system with color increasing southward
 - tidally influenced
 - experiences reverse flow
 - residence time of weeks
 - location of point source nutrient loading
- Design a project to answer the question!

The Next Level

Catchment Delineation and Land Use Classification

- GIS ArcMap 8.3
- USGS Digital Elevation Map
- Arc Hydro
- 2000 Aerial Photography

